



LR1112

Preliminary

LINEAR INTEGRATED CIRCUIT

150mA, LOW QUIESCENT CURRENT, FAST TRANSIENT LOW DROPOUT LINEAR REGULATOR

DESCRIPTION

The UTC **LR1112** is a CMOS-based 150mA voltage regulator with low supply current, low dropout, adjustable and fixed output voltage. The device consists of pass element, error amplifier, band-gap, current limit and thermal shutdown circuitry. The device is turned on when EN pin is set to logic high level.

FEATURES

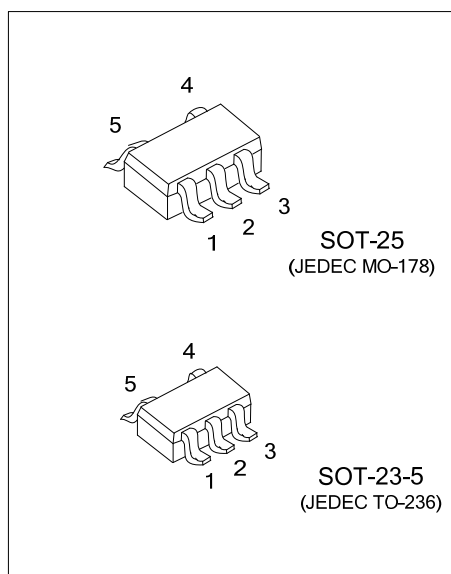
- * 150mA low dropout regulator with EN
- * Very low I_Q over full load: 30 μ A
- * Wide input voltage range: 2.5~6V
- * Wide adjustable output: 0.8V~5.0V
- * Fixed output options: 1.0V~3.3V
- * Fast start-up time: 80 μ s
- * PSRR: 65dB at 100Hz
- * Stable with low ESR, 1 μ F ceramic output capacitor
- * Low dropout: 150mV typical at 150mA
- * Excellent Load/Line Transient Response
- * Current limit protection
- * Ambient temperature range: -40°C~85°C

ORDERING INFORMATION

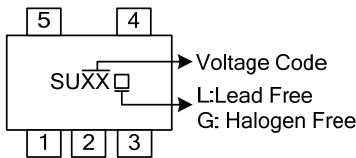
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR1112L-xx-AE5-R	LR1112G-xx-AE5-R	SOT-23-5	Tape Reel
LR1112G-xx-AF5-R	LR1112G-xx-AF5-R	SOT-25	Tape Reel

Note: xx: Output Voltage, refer to Marking Information.

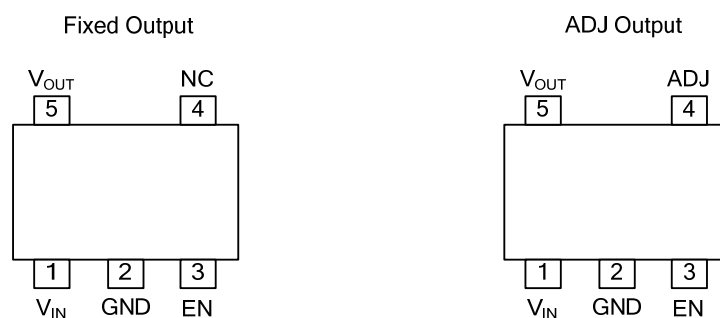
LR1112G-xx-AE5-R	(1)Packing Type (2)Package Type (3)Output Voltage Code (4)Green Package	(1) R: Tape Reel (2) AE5: SOT-23-5, AF5: SOT-25 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free, L: Lead Free
------------------	--	---



MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-23-5 SOT-25	AD: ADJ	

PIN CONFIGURATION

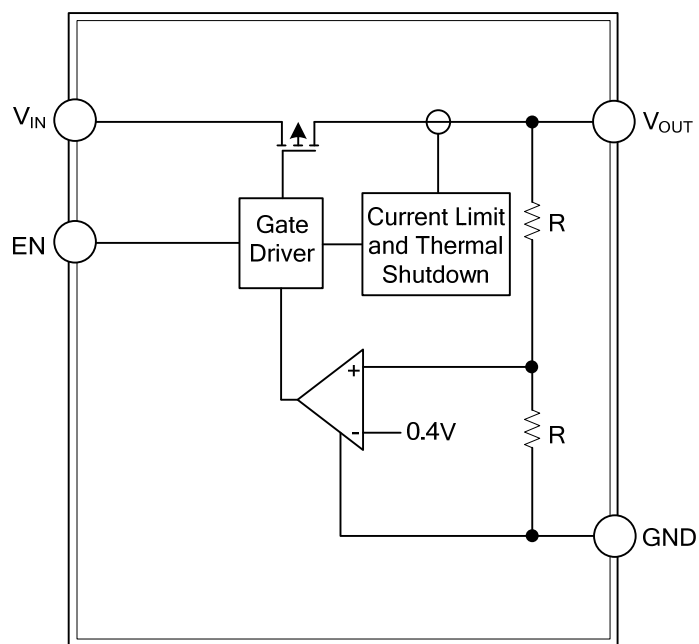


PIN DESCRIPTION

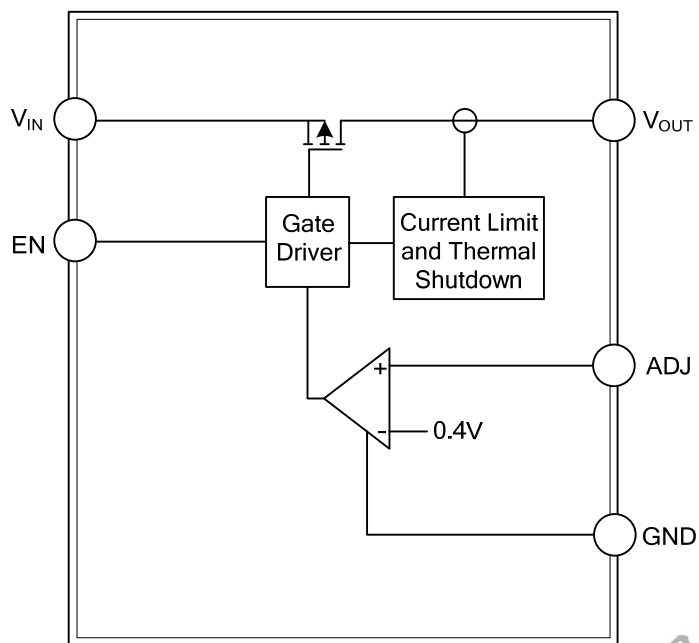
PIN NO.		PIN NAME	DESCRIPTION
Fixed	ADJ		
1	1	V_{IN}	Voltage input pin. Bypass to ground through at least 1 μ F capacitor
2	2	GND	Ground
3	3	EN	Enable input, active high
-	4	ADJ	Output feedback pin
4	-	NC	No connection
5	5	V_{OUT}	Voltage output pin. Bypass to ground through 1 μ F ceramic capacitor

■ BLOCK DIAGRAM

Fixed Version



Adjustable Version



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	7	V
EN Voltage		$V_{IN}+0.3$	V
Continuous Load Current		Internal Limited	
Power Dissipation (Note 1)	P_D	640	mW
Junction Temperature	T_J	+150	°C
Operating Junction Temperature Range	T_{OPR}	-40 ~ +125	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}	2.5		6	V
Output Current (Note 2)	I_{OUT}	0		150	mA
Operating Ambient Temperature	T_A	-40		85	°C

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	280	°C/W

Note: θ_{JA} is measured in the natural convection at $T_A=25^\circ\text{C}$ on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

■ ELECTRICAL CHARACTERISTICS

(T_A=25°C, V_{IN}=V_{OUT}+1V, C_{IN}=1μF, C_{OUT}=1μF, V_{EN}=2V, unless otherwise stated)

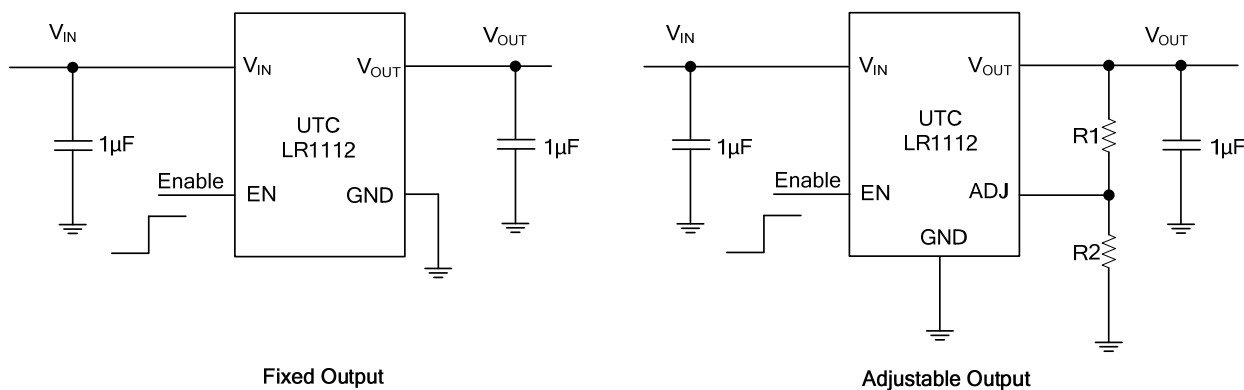
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Quiescent Current	I _Q	V _{EN} =V _{IN} , I _{OUT} =0mA		30	50	μA
		V _{EN} =V _{IN} , I _{OUT} =150mA		50	85	μA
Input Shutdown Current	I _{SHDN}	V _{EN} =0V, I _{OUT} =0mA			1	μA
Input Leakage Current	I _{LEAK}	V _{EN} =0V, OUT grounded			1	μA
Dropout Voltage (Note 3)	V _{Dropout}	I _{OUT} =150mA		150	300	mV
ADJ Reference Voltage (Adjustable Version)	V _{REF}	I _{OUT} =0mA		0.4		V
ADJ Leakage (Adjustable Version)	I _{ADJ}				1	μA
Output Voltage Accuracy	V _{OUT}	T _A =-40°C~85°C, I _{OUT} =30mA	-2		2	%
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN}/V}$	V _{IN} =(V _{OUT} +1V)~V _{IN-Max} , V _{EN} =V _{IN} , I _{OUT} =1mA		0.01	0.20	%/V
Load Regulation	$\frac{\Delta V_{OUT}}{I_{OUT}}$	V _{IN} =(V _{OUT} +1V)~V _{IN-Max} , I _{OUT} from 1mA to 150mA	-0.6		0.6	%
Start-Up Time	t _{ST}	V _{EN} =0V~2.0V, V _{OUT} =1.8V I _{OUT} =150mA		80		μs
PSRR	PSRR	V _{IN} =[V _{OUT} +1V]V _{DC} +0.5V _{ppAC} , f=100Hz, I _{OUT} =30mA		65		dB
Current Limit	I _{LIMIT}	V _{IN} =(V _{OUT} +1V)~V _{IN-Max} , V _{OUT} /R _{OUT} =0.5A	200	300		mA
EN Input Logic Low Voltage	V _{IL}	V _{IN} =V _{IN-Min} ~V _{IN-Max}			0.4	V
EN Input Logic High Voltage	V _{IH}	V _{IN} =V _{IN-Min} ~V _{IN-Max}	1.4			V
Thermal Shutdown Threshold	T _{SHDN}			140		°C
Thermal Shutdown Hysteresis	T _{HYS}			15		°C

Notes: 1. Ratings apply to ambient temperature at 25°C

2. The device maintains a stable, regulated output voltage without a load current.

3. Dropout voltage is the voltage difference between the input and the output at which the output voltage drops 2% below its nominal value. This parameter only applies to output voltages above 1.8V.

■ TYPICAL APPLICATION CIRCUIT



$$V_{OUT} = V_{REF} \left(1 + \frac{R1}{R2} \right)$$

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.